ROYAL ASTRONOMICAL SOCIETY.

VOL. VIII. *May* 12, 1848. No. 7.

SIR J. F. W. HERSCHEL, Bart., President, in the Chair.

The Rev. T. P. Dale, Rector of St. Vedart, Foster Lane; Major Thomas Vallancey Lysaght, Hingolee, India; Stephen Fenwick, Esq., Mathematical Master at the Royal Military Academy, Woolwich; and the Rev. Henry Halford Jones, of Manchester; were balloted for, and duly elected Fellows of the Society.

The following were also balloted for, and duly elected Associates of the Society:—Dr. P. H. L. von Boguslawski, Breslaw; Dr. C. Bremiker, Berlin; Dr. A. L. Busch, Königsberg; Dr. Thomas Clausen, Dorpat; Professor A. Colla, Parma; M. H. D'Arrest, Berlin; M. Daussy, Paris; M. H. Faye, Paris; Dr. J. F. G. Galle, Berlin; Dr. B. Goldschmidt, Göttingen; M. K. C. Hencke, Göttingen; Professor K. Knorre, Nicolajew; M. Laugier, Paris; Professor J. H. Mädler, Dorpat; M. Mathieu, Paris; M. V. Mauvais, Paris; Dr. C. A. F. Peters, Pulkowa; Dr. A. C. Petersen, Altona; M. K. C. Rümker, Hamburg; M. Otto von Struve, Pulkowa; M. Max. Weisse, Cracow.

METIS.

Discovered at Mr. Cooper's Observatory, Markree, Sligo, by Mr. A. Graham.

Extract of a Letter from Mr. Graham.

"Two names have been suggested to Mr. Cooper: 'Thetis,' with a wave for symbol; and 'Metis,' one of the Oceanides, with an eye for the symbol. Μητις (a *prudent plan* or *counsel*) is appropriate so far as the name is concerned, the discovery of the planet having resulted from a plan of observation devised by Mr. Cooper. He has directed me to choose, and I have selected the latter name (*Metis*). I trust, therefore, that astronomers will adopt this name, with an eye and star for symbol."

Ephemeris at Greenwich Mean Noon. By Mr. Graham.

1848.	R.A. h m s	Decl. ° ′ ″	Log Δ.
June 1	14 23 45·46	−11 22 55·1	0·24336
2	23 9·51	22 32·6	24529
3	22 35·03	22 17·0	24727
4	22 2·02	22 8·5	24929
5	21 30·52	22 7·1	25134
6	21 8·56	22 13·0	25343
7	20 32·14	26 26·0	25556
8	20 5·25	22 46·2	25772
9	19 39·92	23 13·7	25992
10	19 16·16	23 48·5	26215
11	18 53·97	24 30·5	26440
12	18 33·34	25 19·7	26669
13	18 14·29	26 16·1	26900
14	17 56·81	27 19·7	27133
15	17 40·90	28 30·5	27369
16	17 26·56	29 48·4	27607
17	17 13·78	31 13·3	27847
18	17 2·57	32 45·3	28089
19	16 52·92	34 24·3	28333
20	16 44·81	36 10·2	28578
21	14 16 38·25	−11 38 3·0	0·28825
June 22	14 16 33·23	−11 40 2·7	0·29073
23	16 29·74	42 9·1	29323
24	16 27·78	44 22·3	29574
25	16 27·34	46 42·1	29827
26	16 28·44	49 8·6	30081
27	16 31·05	51 41·7	30335
28	16 35·16	54 21·2	30590
29	16 40·75	57 7·2	30846
30	16 47·83	11 59 59·6	31102
July 1	16 56·37	12 2 58·2	31359
2	17 6·37	6 3·0	31616
3	17 17·81	9 13·9	31874
4	17 30·70	12 30·8	32131
5	17 45·00	15 53·6	32389
6	18 0·70	19 22·2	32647
7	18 17·79	22 56·5	32905
8	18 36·26	26 36·5	33163
9	18 56·09	30 21·9	33420
10	19 17·24	34 12·7	33677
11	14 19 39·72	−12 38 8·6	0·33934

Elements. By Mr. Graham.

Epoch 1848, April 30·0, Greenwich M.T.

M	141° 54′ 11″·82	
$\varpi - \Omega$	4 20 27·72	M. Eq. 1848, April 30.
Ω	68 29 40·44	
i	5 35 23·98	
φ	7 13 36·92	
Log a	0·3777174	
μ	962″·5660	

Constants for the above Elements.

$x = r\,a \sin(A+v)$	A = 162° 44′ 32″·20 + 1·003 d Ω
$y = r\,b \sin(B+v)$	B = 75 13 7·69 + 1·010 d Ω
$z = r\,c \sin(C+v)$	C = 61 59 21·64 + 0·889 d Ω
Log $e'' = 4·4141037$	log $a = 9·9982090 - 0·06\,d$ Ω
Log $k_1 = 0·1596643$	log $b = 9·9558531 + 0·94\,d$ Ω
Log $k_2 = 0·2145892$	log $c = 9·6418570 - 3·55\,d$ Ω

r being the radius vector and v the true anomaly. These constants are calculated with an obliquity = 23° 27′ 23″, and are referred to the mean equinox of April 30.

Observations.

MARKREE. (MM. Cooper & A. Graham.)

Greenwich M.T. 1848.	R.A. h m s	Decl. ° ′ ″
April 29·451017	14 52 36·88 − [9·250] ÷ Δ	−12 23 54·7 + [0·886] ÷ Δ
May 3·407148	48 39·48 − [9·362] ÷ Δ	13 12·6 + [0·878] ÷ Δ
5·440066	46 33·40 − [9·203] ÷ Δ	7 52·0 + [0·887] ÷ Δ
5·516892	14 46 28·56	−12 7 37·8 + [0·894] ÷ Δ

"The last was taken with the meridian circle. The planet was compared with the following stars:"—

				R.A. h m s	Decl. ° ′ ″
April 29	Bessel xiv. 1031				
May 3	——	956	H.C. 1800	14 47 47·38	−11 57 27·0
5	——	846,956	— 1800	14 46 42·65	−11 49 21·8

ALTONA. Meridian. (Prof. Schumacher and Dr. Petersen.)

1848.	Altona M.T. h m s	R.A. h m s	Decl. ° ′ ″
May 5	11 50 46·1	14 46 31·65	−12 7 42·5
6	45 50·4	45 31·63	5 11·4
7	40 54·4	44 31·44	2 41·42
8	35 58·9	43 31·60	−12 0 12·4
9	31 3·6	42 32·12	−11 57 49·4
10	26 9·0	41 33·25	55 19·6
11	11 20 33·1	14 40 34·90	−11 53 1·1

"The three last observations are not very good on account of the faintness of the planet. The places depend on *α Virginis* and *β Libræ*, taken from the *Nautical Almanac*."

HAMBURG. Meridian. (MM. C. & G. Rümker.)

1847.	Hamburg M.T. h m s	R.A. Circle. h m s	R.A. Transit. s	Dec. ° ′ ″
May 5	11 50 46·1	14 46 31·64	31·39	−12 7 47·5
6	45 50·1	45 31·35	31·35	5 16·9
7	40 54·2	44 31·22	31·06	2 45·7
8	35 58·9	43 31·64	....	−12 0 18·9
9	31 3·5	42 32·03	31·89	−11 57 52·4
10	26 9·1	41 33·29	33·60	55 29·2
11	21 14·8	40 34·77	....	53 6·9
12	16 21·3	39 37·03	....	50 55·0
13	11 27·7	38 39·15	39·31	48 39·6
14	11 6 35·2	14 37 42·46	....	−11 46 26·6

DURHAM. Equatoreal. (Prof. Chevallier & Mr. R. A. Thompson.)

1848.	Greenwich M.T. h m s	R.A. h m s	N.P.D. ° ′ ″
May 6	10 40 46·1	14 45 32·28	102 5 12·8
8	10 52 5·7	43 31·33	102 0 7·6
9	12 2 46·4	42 28·63	101 57 32·1
10	10 56 58·4	14 41 32·38	101 55 15·3

Observations corrected for refraction only.

The star of comparison was observed on the meridian on May 9 and 10, and its place found to be,—

R.A. 14 h 44 m 40·32 s N.P.D. 102 ° 0 ′ 57·5 ″ 8 Mag.

HARTWELL. Equatoreal. (MM. Hind and Reade.)

1848.	Greenwich M.T. h m s	R.A. h m s	N.P.D. ° ′ ″
May 4	10 38 19	14 47 34·24	102 10 25·0
5	10 28 35	14 46 34·10	102 7 47·9

"The star of comparison is not found either in Lalande's or Bessel's catalogues. Its apparent place was obtained by comparison with Bessel xiv. 846 and 931. The declinations deduced from comparisons with these stars differ 10″. The apparent place adopted is

R.A. 14 h 47 m 27·54 s N.P.D. 102 ° 1 ′ 33·9 ″

SOUTH VILLA. Equatoreal. (MM. Bishop and Hind.)

1848.	Greenwich M.T. h m s	R.A. ° ′ ″	N.P.D. ° ′ ″
April 30	13 39 31	222 52 3·3 + 0·232 *p*	102 20 44·1 − 0·886 *p*
May 1	11 21 17	222 38 26·9 + 0·138 *p*	102 18 17·1 − 0·891 *p*

CERES.

Observations.

HAMBURG. Merid. Circle & Transit. (MM. C. & G. Rümker.)

1848.	Hamburg M.T. h m s	R.A. Mer. Circle. h m s	R.A. Transit. s	Decl. ° ′ ″
March 22	11 46 55·2	11 49 11·72	....	+ 19 45 8·5
27	23 7·9	45 3·19	2·98	19 58 37·6
28	18 24·0	44 15·22	15·31	20 0 33·6
30	8 58·7	42 41·39	41·55	3 42·5
31	11 4 17·5	41 55·77	55·95	4 56·0
April 1	10 59 37·1	41 11·38	11·46	5 51·3
2	54 57·1	40 27·13	....	6 34·7
3	50 18·4	39 44·34	44·58	7 2·9
4	10 45 41·2	39 2·82	2·70	20 7 14·4
15	9 56 8·0	32	43·55	.....
16	9 51 45·4	11 32 16·76	16·44	+ 19 50 43·4

PALLAS.

Observations.

HAMBURG. Merid. Circle & Transit. (MM. C. & G. Rümker.)

1848.	Hamburg M.T. h m s	R.A. Circle. h m s	R.A. Transit. s	Decl. ° ′ ″
March 17	10 51 53·3	10 34 18·09	18·27	+ 2 3 40·2
21	34 20·5	32	28·46	.....
22	29 59·7	32 3·68	....	4 5 30·4
23	25 41·2	31 40·94	....	4 29 3·4
27	8 40·4	30 23·56	23·42	6 0 6·0
28	4 28·9	30 7·99	8·01	6 21 57·7
29	10 0 19·2	29	54·01	.....
30	9 56 10·6	29 41·31	41·60	7 4 34·0
31	52 3·8	29 30·48	30·60	7 25 22·5
April 1	47 58·5	29 21·10	20·71	7 45 43·0
2	43 55·0	29 13·39	....	8 5 43·1
3	39 53·0	29 7·30	7·03	8 25 15·1
4	35 52·7	29 2·93	3·24	8 44 29·6
10	12 25·2	29 10·84	11·03	10 30 43·7
11	9 8 36·2	29	17·77	.....
14	8 57 18·9	29	48·80	.....
15	53 36·1	30 1·42	1·55	+11 47 50·5
16	8 49 55·6	10 30	16·96	.....

IRIS.

Observations.

LEYDEN. 8-foot Fraunhofer. (Professor Kaiser.)

1847.	Leyden M.T. h m s	R.A. ° ′ ″	No. Obs.	Dec. ° ′ ″	No. Obs.
Aug. 26	10 26 48·4	297 0 36·18	8	−13 51 29·01	4
27	8 57 13·2	296 53 12·11	12	53 7·88	6
28	9 48 8·4	296 45 27·27	12	54 50·37	6
30	9 2 43·9	296 32 11·52	12	13 58 16·71	6
Sept. 9	10 12 39·1	295 54 45·77	12	14 12 57·62	4
10	9 31 42·3	295 53 55·21	14	14 9·70	4
11	8 43 35·3	295 53 32·98	12	15 16·99	5
15	9 0 31·7	295 57 14·45	12	19 20·98	5
19	9 10 40·2	296 9 7·42	10	22 30·38	4
28	8 13 34·0	297 4 11·65	12	25 29·69	6
Oct. 2	9 45 11·7	297 41 23·79	8	24 54·10	4
	9 45 11·7	23·23	8	53·25	4
3	7 8 54·2	297 50 35·38	12	−14 24 35·07	5
	7 19 19·2	39·13	12	35·63	5

1847.	Leyden M.T. h m s	R.A. ° ′ ″	No. Obs.	Dec. ° ′ ″	No. Obs.
Oct. 5	7 20 48·1	298 12 31·44	10	−14 23 35·89	7
8	7 39 33·2	298 48 24·98	8	21 25·68	4
9	7 14 53·6	299 1 1·64	10	20 33·56	4
11	6 56 3·6	299 27 33·66	8	18 28·76	3
13	7 38 55·9	299 56 9·47	12	16 4·04	4
	7 38 55·9	9·27	12	3·60	4
14	7 20 34·2	300 10 38·79	12	14 41·84	4
	7 20 34·2	40·24	12	42·04	4
15	8 32 38·5	300 26 30·25	8	13 9·37	4
	8 32 38·5	28·99	8	9·62	4
16	7 32 42·2	300 41 20·66	8	11 38·83	6
20	6 55 21·2	301 46 15·60	8	4 29·91	4
21	7 33 13·4	302 3 52·69	5	.....	—
	7 54 44·0	.....	..	2 20·49	3
22	7 39 39·0	302 21 32·61	10	14 0 16·80	4
26	7 4 27·1	303 34 18·03	12	13 50 30·22	5
Nov. 1	6 43 55·6	305 32 56·02	12	32 36·50	6
8	6 53 40·0	308 4 10·11	12	6 41·17	4
	7 5 3·2	21·21	12	39·08	4
9	6 57 44·5	308 26 52·63	11	13 2 28·78	5
10	6 47 1·3	308 49 30·88	14	12 58 15·83	6
18	7 23 51·2	312 8 31·60	5	.....	—
19	7 20 53·4	312 33 17·36	8	2 47·68	4 D^n ?
21	5 39 0·5	313 14 7·16	12	12 3 37·47	5 D^n ?
24	6 47 44·9	314 31 56·19	11	11 45 50·66	4
29	5 51 48·2	316 42 6·98	12	14 35·28	4
Dec. 1	6 53 57·6	317 36 54·43	10	11 0 53·39	4
14	5 30 9·0	323 38 8·67	13	9 22 38·61	6
21	6 4 5·2	327 2 49·24	10	8 21 26·21	4
30	5 21 14·6	331 31 43·42	19	6 55 23·35	6
1848.					
Jan. 4	5 14 53·7	334 4 35·84	13	6 4 2·45	6
5	5 13 12·3	334 35 24·87	16	5 53 32·16	6
8	5 34 54·6	336 8 59·72	12	5 21 8·63	4
13	5 31 19·8	338 45 31·79	15	4 25 29·38	5
14	5 46 6·3	339 17 22·96	10	4 13 59·26	4
20	6 20 45·9	342 28 45·31	11	3 3 57·48	4
26	6 30 33·2	345 41 46·59	12	1 51 25·48	4
27	5 44 44·5	346 13 6·52	14	1 39 24·76	4
Feb. 1	5 40 10·1	348 55 51·78	11	−0 36 56·87	4
Mar. 3	6 51 55·0	6 18 41·59	12	+6 12 50·72	4
	7 12 6·1	19 14·00	10	13 5·33	4
4	6 51 59·7	6 53 8·27	12	6 26 22·58	5
14	7 26 54·5	12 42 34·43	11	+8 40 38·30	4

FLORA.

HAMBURG. Equatoreal. (M. C. Rümker.)

1848.	Hamburg M.T. h m s	R.A. ° ′ ″	Dec. ° ′ ″	No. of Obs.
March 17	8 36 46·3	79 17 4·4	+22 54 48·2	12
19	9 15 4·3	80 9 6·0	23 2 36·5	6
20	8 2 22·2	80 33 57·4	6 21·7	14
22	8 3 37·0	81 26 21·2	13 35·1	7
23	9 3 37·2	81 54 5·7	17 17·6	5
27	8 32 18·4	83 40 55·5	30 23·4	17
28	8 40 32·6	84 8 20·4	33 35·9	10
30	8 9 50·4	85 2 38·8	39 9·6	11
31	8 29 14·8	85 30 48·0	42 2·8	13
April 1	9 21 20·0	85 59 37·0	44 56·1	6
2	8 33 28·3	86 26 29·7	47 11·7	14
3	8 27 8·1	86 54 35·7	49 41·7	17
4	8 27 49·4	87 22 56·3	23 51 53·9	13
9	8 47 19·8	89 46 5·2	24 2 13·5	10
11	8 51 24·0	90 44 9·7	5 26·5	21
14	8 58 49·7	92 11 58·2	9 26·6	25
15	9 53 11·0	92 42 23·8	10 46·0	10
16	9 2 25·5	93 10 47·2	+24 11 39·7	18

DURHAM. (Professor Chevallier & Mr. R. A. Thompson.)

1848.	Greenwich M.T. h m s	R.A. h m s	N.P.D. ° ′ ″	No. of Comp. in R.A.	No. of Comp. in N.P.D.	Star.
Feb. 10	10 28 30·5	4 26 42·95	70 14 11·6	14	14	B.A.C. 1417
11	8 5 46·4	27 39·20	70 8 48·3	19	8	— —
19	8 38 54·8	.....	69 20 31·6	—	5	H.C. 8844
	8 39 30·1	4 36 52·47	.....	9	—	— —
Mar. 7	9 16 57·7	5 0 55·01	67 49 11·3	4	2	B.A.C. 1620

The Stars' places are taken from the Catalogues. No correction has been applied for parallax.

Observations of the Moon, and Stars near her Path.

By Professor Jahn of Leipsic.*

These observations were made on November 18, 19, 20, and December 18, in 1847, and on February 15, 1849.

By MM. C. and G. Rümker, Hamburg.

These include observations on Nov. 18, Dec. 12, in 1847, and Jan. 16, Feb. 12, 15, March 13*, 15, 17*, April 10*, 14, 15, 16*, May 8, 9, 10, 11, 12, 13, 14, 15, in 1848. For the days marked *, the declination of the moon's bright limb is also given.

* Observations of the moon, and stars near her path, are carefully preserved, as they are not unfrequently required for corresponding observations.

Latitude of Durham Observatory.

Professor Chevallier gives as the approximate latitude of this observatory, 54° 46′ 6″·2 N., from many careful observations with his transit circle, the radius of which is one foot.

By a portable transit * placed east and west (Bessel's method), and using *γ Ursæ Majoris*, he finds :—

1848.	°	′	″
May 4	54	46	8·6
6			4·8
9			7·7
Mean	54	46	7·0

Longitude of Poona.

(Captain Jacob's Observatory.)

From the observations inserted in the present volume, p. 133, Mr. H. Breen, of the Royal Observatory, has computed the following results, adopting the formulæ and symbols of the Astronomer Royal in the Greenwich observations, and correcting the place of the moon by a mean of the observations made with the meridian, and altitude and azimuth instruments at Greenwich.

1847.			East Long. h m s
Dec. 13	ℓ Aquarii	Imm.	4 55 35·79
		†Em.	32·73
16	Uranus	Imm.	33·79
		Em.	33·12
East Longitude of Capt. Jacob's Observatory			4 55 33·86

Longitude of Hartwell from Meridian Observations of the Moon.

By Mr. T. Dell.

From observations at Hartwell, compared with corresponding observations at Greenwich, Cambridge, and Oxford, in the months of October and November last, Mr. Dell deduces the following results :—

	m	s		
West longitude of Hartwell,	3	24·26	by 5	comparisons with Greenwich.
		21·32	5	Cambridge.
		23·44	5	Oxford.

The observations are all of the first limb of the moon.

* The instrument is small, and was not very accurately adjusted. This method has not been employed much in this country, but a careful observer, *with a good level*, will obtain in this manner excellent results.

† The Emersion is printed $2^h\ 45^m\ 37^s{\cdot}9$, which Mr. Breen found to be quite inconsistent with the other observations : he has corrected this to $2^h\ 42^m\ 37^s{\cdot}0$.

EXPECTED COMET OF 1264 and 1556.

Extract of a letter from Mr. Hind.

"I believe I have been misunderstood in reference to the time of reappearance of the comet of 1556. However I may have expressed myself, I never intended to imply that, in my idea, the comet would return exactly at the end of a period of 291·7 years, which is the interval between the perihelion passages in 1264 and 1556. On the contrary, I think I am right in stating that the effect of perturbations by *Saturn* and *Neptune* during the last revolution will tend to retard its appearance, while *Jupiter* will not exercise any serious influence either one way or the other. If the mean motion in 1556 corresponded to the semi-major axis given by the interval between 1264 and 1556, the next return of the comet may very probably be delayed many months, possibly one or two years, beyond the present time. I have now in the press a small work* upon this comet, in which I have collected nearly all that is known of its former history, with ephemerides for the approaching return.

HIND'S CHANGING STAR.

Extracts of a Letter from Mr. Hind to the President, dated May 2, respecting the star newly discovered by him in Ophiuchus; with remarks by other astronomers.

"My acquaintance with the neighbourhood commenced in February; and I am able to state with confidence that, up to April 5, no star so bright as 9·10 magnitude had been noticed in the position of the new one. Yesterday morning I estimated it of the 5th magnitude, or equal to 20 *Ophiuchi*; it hardly appeared so bright as on April 29 A.M., but haze prevailed in many directions and may have partially obscured it. I believe I mentioned in my former letter, that a planetary disc was suspected under high magnifiers, but I am by no means satisfied with the observation. On the contrary Mr. Dawes assures me, that with Mr. Lassell's nine-foot reflector, and powers up to 600, it has nothing planetary in its appearance.

"In the appendix to the *Connaissance des Temps* for 1846, M. Biot has given a translation of Ma-touan-lin's catalogue of *Extraordinary Stars* observed in China. Amongst these I find,—

B.C. 134 in July. A strange star in the asterism formed by β, π, ρ, &c. *Scorpii*.
48 in May. A star 4° distant from μ *Sagittarii*.
A.D. 123 in December. In the region about α *Herculis* and α *Ophiuchi*.
173 December 10. Between α and β *Canis Minoris*, presenting "the five colours," and remaining visible until July 174.

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* This work has already appeared under the title, "On the expected Return of the Great Comet of 1264 and 1556." By J. R. Hind, 8vo. pp. 78. London, G. Hoby, 123 Mount Street, Berkeley Square. The ephemerides on the hypothesis of different times of perihelion passage are contained in pp. 62–67.

369 March to August.

386 April to July, in *Nan-teou* (λ, μ, ϕ, &c. *Sagittarii*). Remained there during the whole period.

393 March to October in the sidereal division *Ouei* (commencing at μ^2 *Scorpii* and extending 18° in right ascension): declination indeterminate.

1011 February 8. A strange star seen near the square of *Nan-teou* (σ, τ, ζ, ϕ *Sagittarii*). This is probably the object referred by Hepidannus to the year 1012, which was of extraordinary brilliancy, remaining visible in the southern parts of the heavens during three months.

1203 July 28. A star appeared under the sidereal division *Ouei* (∴ right ascension was greater than that of μ^2 *Scorpii*, but did not exceed it more than 18°): declination indeterminate.

1584 July 1. A strange star in the division *Fang* (∴ right ascension greater than that of π *Scorpii*, but not exceeding it more than 5°.

"I mention these stars because they appeared in the neighbourhood of the milky way, and therefore bear out the inference in your note, as to the general locality of "irregular stars." By far the greater number of the objects mentioned in Ma-touan-lin's catalogue of *Extraordinary Stars* were certainly comets, as is evident from their motion, but not appearing with trains, did not strictly come under the Chinese definition of a comet. The cases of new stars remote from the *via lactea* in this catalogue, are *very few indeed.* I never noticed this circumstance before.

"My measures of differences of right ascension and declination between the new star and Weisse xvi. 956, do not indicate any change of position.

Sidereal Time.			
	h m	s	′ ″
April 27, at	16 36	$\Delta\alpha = +14^s\cdot89$	$\Delta\delta = +18\ 22''\cdot8$
28,	15 55	$= +14^s\cdot94$	$= +18\ 21''\cdot7$
May 1,	16 ±	$= +14^s\cdot8$	not observed.

"Professor Challis says his position, obtained on the night of the 28th, agrees exactly with mine for the previous night.

There are two small stars near the new one.

	Pos. °	Dist. ′ ″
a 11th mag.	249·4	7 54
b 10·11	144·5	8 49

"I had intended to repeat the micrometric measures frequently with all possible accuracy, *i.e.* supposing the star does not vanish as suddenly as it has become visible.

"Mr. Woolgar remarks 'that this particular spot must have often been examined by astronomers during the last and early part of the present century, it being within a few minutes of the site assigned to the spurious star 52 *Serpentis* * * Mr. Baily alleges that its introduction arose from a mistake in the determining star (η *Herculis* for η *Ophiuchi*).'"

"Dr. Petersen, at Altona, 'first observed the new star on April 30, and estimated it of the 6th magnitude. On May 4 he set it down as 5·6. It was carefully compared with ν *Serpentis* on May 7, and was found to be a little smaller than that star. On May 11

it was considerably fainter than *ν Serpentis* and *Piazzi* xvii. 191, and a little brighter than a star of about the 6th magnitude, the apparent place of which was observed to be,—

	h m s		° ′ ″
R.A.	17 1 26·19	Decl.	−10 19 6·9

"It has a very intense reddish-yellow light, and sometimes it appears to me that the red light becomes suddenly stronger, and as suddenly vanishes altogether.

"The apparent places of the changing star are,—

1848.	R.A. h m s	Decl. ° ′ ″	Mag.
April 30	16 51 1·23	−12 39 17·0	6
May 4	1·24	13·8	5½
7	1·42	13·8	5¼
11	16 51 1·50	−12 39 14·7	5¾

Mr. Rümker remarks "that he does not know whether it is an optical illusion, but more rays appear to issue from it, in his opinion, than from other stars.

"Mr. Graham says,—'Your star is a most curious object. We observed it with the meridian circle on the 5th. I suppose your remark had some influence on my imagination, for it seemed to me in the large equatoreal to give symptoms of a disc.'"

From a communication by Mr. Hind *to the Society dated May 29.*

"It appears that on many of our globes, and on some charts, a star, called 52 *Serpentis*, is inserted nearly in the position of the new one. 52 *Serpentis* is one of the stars which Mr. Baily has notified as having been introduced into the *British Catalogue*, through an error of calculation on the part of Flamsteed, who, Mr. Baily remarks, has employed the right ascension of *η Herculis* as a determining point, instead of that of *η Ophiuchi*. The position assigned to 52 *Serpentis*, reduced to 1848, does not exactly agree with that of the New Star; still, assuming that such a star had really been observed by Flamsteed, the differences might have originated in a great proper motion, and it therefore became a matter of importance to ascertain the precise nature of the error committed by Flamsteed, whether under any circumstances 52 *Serpentis* could have existed.

We find for 1848,0,

	R.A. h m s	N.P.D. ° ′ ″
52 Serpentis	16 52 34·8	102 45 58
Nova	16 50 59·1	102 39 16

"Through the kindness of the Astronomer Royal I have been favoured with a view of the original calculations, &c., preserved at the Royal Observatory, Greenwich. To ascertain the right ascension of an unknown object, Flamsteed's plan was to refer it to that of some well-determined star, observed on the same day. On

1690, June 16, four stars were observed on the meridian, the first being certainly *η Ophiuchi* (as Flamsteed calls it), and not *η Herculis*, which is shewn by the zenith distances read off from the instrument. This is used by Flamsteed as a determining star for the other three, which were really *ν*, *ξ*, and *ο Serpentis*, as the observed zenith distances, and, the transits referred to *η Ophiuchi* undoubtedly prove. In fact, reducing the positions of the four stars to 1690, we find,—

	m s	N.P.D. ° ′
η Ophiuchi.....		105 17·6
ν Serpentis follows *η* Ophiuchi	10 47·1	102 29·6
ξ	27 13·3	105 9·6
ο	31 22·8	102 40·0

"The observed intervals and north polar distances were,

	Interval. m s	Observed N.P.D. to nearest minute. ° ′
η Ophiuchi.....		105 17
First Star (*ν* Serp.) after *η* Oph....	10 47	102 29
Second Star (*ξ* Serp.) — ...	27 39	105 9
Third Star (*ο* Serp.) — ...	31 23	102 39

"There appears to be some error in the observation of right ascension of *ξ Serpentis*, or in the reduction, amounting to 25^s.

Flamsteed has taken for the right ascension of *η Ophiuchi* the 'determining star' of 1690, June 16, $16^h\ 32^m\ 58^s$, and hence finds,—

	R.A. h s m	N.P.D. ° ′
First Star	16 43 45	102 29
Second Star	17 0 37	105 9
Third Star	17 4 21	102 39

"The *first* is the spurious star 52 *Serpentis*, and the *third* another spurious star, 54 of the same constellation; but it is singular that no use whatever has been made of the *second* observation by Flamsteed, otherwise, instead of two we should have three stars introduced into the catalogue, none of which are found in the heavens.

"The right ascension adopted as a determining point, $16^h\ 32^m\ 58^s$, is not exactly that of *η Herculis*, which would in 1690 = $16^h\ 32^m\ 18^s$. Probably, therefore, all this confusion has arisen from some error of copy. In the present case it is extremely satisfactory to be able to refer to the original calculations, and shew from them that no such star as 52 *Serpentis* ever did exist. It is a practical proof of the almost imperative necessity of preserving *original* observations, notwithstanding the observer himself may fancy he has guarded against all possible sources of error in his published results.

"52 and 54 *Serpentis* should therefore be omitted in all charts and globes."

Orbit of Binary Star near μ^2 Boötis. By Mr. Hind.

"I have lately calculated another orbit for the star near μ^2 *Boötis*, my object being to ascertain what alterations would be required to represent Mr. Dawes' measures of 1846, published in the *Monthly Notices* of the Astronomical Society. The new elements are as follow:—

Perihelion Passage	1852·504	tan. $45^\circ + \frac{1}{2}\phi = 0{\cdot}53041$
Position of Perihelion	226° 25′	Log. $e_{,} = 3{\cdot}46058$
Node	117 21	Cos. $i = 9{\cdot}83420$
Angle between π and Ω ...	103 17	
Inclination.....	46 57	
Excentricity	0·84006 = sin. 57° 8′·7	
Mean Annual Motion	−33″·245	
Semi-major Axis ..	3″·218	
Period	649^{yrs}·72	

Ephemeris from these Elements.

	°	″
1847·00.....	282·50	0·618
1847·50.....	279·52	0·591
1848·00.....	276·35	0·563
1848·50.....	272·84	0·532
1849·00.....	268·84	0·501

"I have no observations since 1846·80 (Mr. Dawes' epoch), and therefore cannot check the orbit. This appears to be an important period; if I am not mistaken, differences in the observed angle, by no means improbable, would suffice to *shorten* the period very considerably."

On an easy Method of approximating to the distance of a Planet from the Sun by means of two Observations only, made near the Planet's opposition. By Professor Chevallier.

If v be the linear velocity of the earth, and r the distance of the planet from the sun, the earth's distance being 1, the linear velocity of the planet $= \frac{v}{\sqrt{r}}$.

Also the angular retrograde velocity of the planet at or near opposition $= \frac{1}{r-1}\left(v - \frac{v}{\sqrt{r}}\right) = \frac{v}{\sqrt{r}\,(\sqrt{r}+1)}$

Again, let L, L′, be the heliocentric longitudes of the earth at the times of observation, and l, l' the *geocentric* longitudes of the planet, and let $n = \frac{L'-L}{l-l'} = \frac{\text{Heliocentric Velocity of the Earth}}{\text{Geocentric Velocity of the Planet}}$,

since the heliocentric velocity of the earth $= v$,

we have $n = \sqrt{r}\,(\sqrt{r}+1)$ and $r = \frac{1}{2}\,(1 + 2n - \sqrt{1+4n})$.

Using this formula, Mr. Chevallier deduces from the Durham observations, May 6, and 10, a mean radius vector which agrees very nearly with that computed by Mr. Graham.

On a Formula for reducing Observations in Azimuth of Circumpolar Stars near Elongation, to the Azimuth at the greatest Elongation. By Captain Shortrede.

In trigonometrical surveys the direction of a chain of triangles is often deduced from the observed azimuth of a circumpolar star at its greatest elongation. The method is convenient, as an accurate knowledge of the time is not requisite, and the latitude is generally sufficiently well known. It is indeed necessary to have the polar distance of the star with the utmost precision. In the northern hemisphere, *Polaris* and δ *Ursæ Minoris* are usually employed.

When the time is known with tolerable certainty, it is much more satisfactory to observe the star frequently, both before and after its greatest elongation, and Captain Shortrede in this memoir gives a demonstration of the formula which he has found most convenient for reducing such a series of observations of azimuth to the azimuth at the greatest elongation.

He deduces an *exact* expression for the tangent of the difference of each azimuth from the greatest azimuth, in which the only variable quantities are, the time from the greatest elongation, and the arc joining the position of the star at its greatest elongation with its position at the time of observation. The formula is easy of computation, and, when many observations have been made, would greatly facilitate their reduction.

Captain Shortrede shews, that in most cases an approximate computation of the principal variable, viz. of the secant of the arc above-mentioned, would be sufficient, and that this may be very readily effected by a formula involving $\log \frac{\text{ver. sin}}{\sin 1''}$: a table of this function for all arcs up to 1^h is added to the memoir.

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*On a Regulated Time-ball.** By Professor Chevallier.

"The usual method of indicating the time by a ball is by permitting the ball to fall freely, the motion being a little accelerated at first by a spring. It is evident that this method is subject to some uncertainty as to the particular instant of time which is to be observed. There is also some inconvenience arising from the derangement to which the apparatus is liable by the sudden stoppage of the motion of the ponderous ball.

"It is proposed to remedy these disadvantages by regulating the descent of the ball, so that its motion may be uniform, and causing it to pass through three or five horizontal hoops. The motion may be so regulated that the ball may pass through the distance between

* See p. 16 of the present volume.

one hoop and another in a determinate interval, as about 20^s; and the mean of the times at which the ball is observed to pass the successive hoops may be taken as in the observation of the transit of a star.

"If the ball is spherical, the time of its bisection by the hoops may be noticed.

"The observer is supposed to be at some distance from the apparatus, so that his eye may not be very far distant from the plane of any of the hoops."

Notice of Errata in Standard Catalogues, communicated by M. Faye.

B. A. C. 3836 *Leonis*; *Hist. Cél.* 21467.

"The position of this star in the B. A. C. depends wholly on the observations contained in the *Hist. Cél.* p. 325. It has since been observed by Bessel and by myself. The mean places for Jan. 1, 1848, are,—

	R.A. h m s	Dec. ° ′ ″	
Lalande	11 6 4·87	+3 4 49·6	Error of 1′ in B. A. C. and *Hist. Cél.*
Bessel.....	4·81	5 45·6	
Faye	4·73	5 50·1	

Groombridge 1867.

"On comparing the R.A. of this star with *Johnson's Observations*, 1844, and with the *Hist. Cél.*, the position in Groombridge is found to be 35^s in error."

Colonel Batty sent for inspection a curious dial, of the workmanship of Nicholas Kratzer, Horologier to King Henry VIII., and the friend of Holbein.

This consists of a block cut into various faces and hollows, each serving for a dial, mounted on a foot, and furnished with a plumb-line for rectification. There is a hollow on the top, which it is conjectured was meant to receive a compass. The date is 1542, and the arrangement and ornamental work very elegant.

Colonel Batty has supplied the following biographical notice of Kratzer, extracted from Bliss's edition of Wood's *Athenæ Oxonienses*:—

"Nicholas Kratz was born at Munich, and educated at the universities of Cologne and Wittenburg. He came to England with the degree of B.A., was made Fellow of Corpus Christi, Oxford, by Bishop Fox, in 1517, gave lectures in astronomy in that university on the king's order, and was appointed mathematical reader by Cardinal Wolsey.

"He seems to have written several mathematical treatises, which are still in MSS., chiefly in the Bodleian Library. One of

these, which is reputed to be his, is *De Compositione Horologionum.*

"He made the old dial which is now in the garden of Corpus, and another standing on a pillar in the churchyard of St. Mary's. He was living in the year 1550, and after his death many of his books came into the hands of Dr. John Dee, and some into those of Dr. Richard Forster."

Lunar Eclipse of March 19, 1848.

Extract of a Letter from the Rev. Charles Mayne, Killaloe.

"The eclipse was observed with an excellent 30 inch telescope of 2 inches aperture, fixed pretty firmly to the window sash. Nothing particular was noted at first. The moon was seen well at intervals between clouds for an hour and a half, and then was completely covered. Some considerable time after, one of the family going to the window exclaimed, 'the eclipse is over!' I went to the window and saw the *whole* of the moon, the colour much like that of tarnished copper, *i. e.* of a dullish red, some parts being darker than others. After looking at it for some time, I perceived with great surprise that the eclipsed part was marked, but (from the general effect produced on the moon) only indistinctly. Clouds soon after covered the whole sky, and the moon was not again visible till about a quarter of an hour before the end, when the appearance was as usual, the eclipsed part nearly black and the rest perfectly bright. I am told that *aurora* was visible the same night.

Captain Jacob has forwarded a considerable catalogue of double stars observed by him at Poona in the years 1845–8, with a 5-foot equatoreal by Dollond.

In accordance with the desire expressed by Sir John Herschel, Captain Jacob has transmitted drawings of the solar spots observed at Poona in the month of March last.

Erratum in the Monthly Notice for March, p. 126.

The observations of *Flora* at the Durham Observatory are corrected for *refraction* but not for *parallax*.

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